BIPOLARICS, INC. Part Number BRF504

NPN LOW NOISE SILICON MICROWAVE TRANSISTOR

PRODUCT DATA SHEET

FEATURES:

- High Gain Bandwidth Product
  f_t = 10 GHz typ @ I_C = 4mA
- Low Noise Figure
  1.6 dB typ at 1 GHz
  2.0 dB typ at 2 GHz
- High Gain
  $|S_{21}|^2$ = 18.1 dB @ 1 GHz
  12.8 dB @ 2 GHz
- Dice, Plastic, Hermetic and Surface Mount packages available

DESCRIPTION AND APPLICATIONS:

Bipolarics' BRF504 is a high performance silicon bipolar transistor intended for use in low noise application at VHF, UHF and microwave frequencies. High performance low noise performance can be realized at 2 mA or less making the BRF504 an excellent choice for battery application. From 4 mA to over 8mA, f_t is nominally 10 GHz. Maximum recommended continuous current is 16 mA. A broad range of packages are offered including SOT-23, SOT-143, plastic and ceramic 0.085" Micro-X, 0.070" Stripline and unencapsulated dice.

Absolute Maximum Ratings:

SYMBOL	PARAMETERS	RATING	UNITS
V_{CBO}	Collector-Base Voltage	10	V
V_{CEO}	Collector-Emitter Voltage	10	V
V_{EBO}	Emitter-Base Voltage	1.5	V
$I_{C\ CONT}$	Collector Current	8	mA
T_J	Junction Temperature	200	°C
T_{STG}	Storage Temperature	-65 to 150	°C

PERFORMANCE DATA:

- Electrical Characteristics (T_A = 25°C)

SYMBOL	PARAMETERS & CONDITIONS (V_{CE} =8V, I_C = 4 mA unless stated)	UNIT	MIN.	TYP.	MAX.
f_t	Gain Bandwidth Product	GHz		10	
$\|S_{21}\|^2$	Insertion Power Gain: f = 1.0 GHz, I_C = 4 mA I_C = 8 mA f = 2.0 GHz, I_C = 4mA I_C = 8 mA			17.5 18.1 12.8 12.6	
P_{1dB}	Power output at 1dB compression: f = 1.0 GHz	dBm		10	
G_{1dB}	Gain at 1dB compression: f = 1.0 GHz	dBm		15	
NF	Noise Figure: V_{CE} =8V, I_C = 0.8mA f = 1.0 GHz, Z_S = 50Ω	dB		1.6	
h_{FE}	Forward Current Transfer Ratio: V_{CE} = 8V, I_C = 4 mA f = 1MHz		50	100	250
I_{CBO}	Collector Cutoff Current : V_{CB} =8V	μA			0.2
I_{EBO}	Emitter Cutoff Current : V_{EB} =1V	μA			1.0
C_{CB}	Collector Base Capacitance: V_{CB} = 8V f = 1MHz	pF		0.07	